

AMENDMENTS TO THE CLAIMS

Claims 1-8 (Canceled)

9. (Currently Amended) An optical head device comprising:

a light source;

focusing means ~~which focuses~~ for focusing light from the light source onto a desired data layer of an optical recording medium having multiple data layers;

wavefront converting means provided between the light source and the focusing means;

aberration detecting means ~~which detects~~ for detecting an aberration amount of a spot of the focus light on the desired data layer; and

output controlling means ~~which controls~~ for controlling output of the light source, wherein the wavefront converting means is driven in such a manner as to reduce the aberration amount detected by the aberration detecting means, and

the output controlling means holds learned data as to a relation between a driving amount to be inputted to the wavefront converting means and the output of the light source, and controls the output of the light source based on the driving amount to be inputted to the wavefront converting means and the learned data, the driving amount being changed depending on the aberration of the focus light spot.

10. (Currently Amended) The optical head device according to Claim 9, further comprising driving amount detecting means ~~which detects~~ operable to detect the driving amount to be inputted to the wavefront converting means, wherein the output controlling means controls the output of the light source based on the driving amount detected by the driving amount detecting means.

11. (Previously Presented) The optical head device according to Claim 9, wherein the output controlling means controls the output of the light source based on the product of a direct current

component and an alternate current component of the driving amount to be inputted to the wavefront converting means.

12. (Previously Presented) The optical head device according to Claim 9, wherein the wavefront converting means is a liquid crystal device.

13. (Currently Amended) The optical head device according to Claim 9, wherein the wavefront converting means includes a plurality of lenses, and lens driving means ~~which drives~~ for driving one of the plurality of lenses to change a distance between the one lens and the other one of the plurality of lenses, and the lens driving means is driven in such a manner as to reduce the aberration amount detected by the aberration detecting means.

14. (Previously Presented) The optical head device according to Claim 9, wherein the output controlling means controls the output of the light source based on the driving amount and the learned data so as to compensate for a spherical aberration of the order higher than a highest order of aberration compensatable by the wavefront converting means.

15. (Currently Amended) An optical recording device comprising:
the optical head device of Claim 9; and
rotation driving means ~~which rotates~~ for rotating the optical recording medium.

16. (Currently Amended) An optical recording method for recording information on an optical recording medium having multiple data layers with use of a focus light spot emitted from a light source, the method comprising ~~the steps of~~:

learning in advance a relation between a driving amount by which wavefront converting means is to be operated so as to reduce an aberration of the focus light spot, and an output of the light source;

detecting the aberration of the focus light spot;

driving the wavefront converting means so as to reduce the aberration; and
controlling the output of the light source based on the driving amount of the wavefront converting means.

17. (New) An optical head device comprising:

a light source;

a focusing system operable to focus light from the light source onto a desired data layer of an optical recording medium having multiple data layers;

a wavefront converter provided between the light source and the focusing system;

an aberration detector operable to detect an aberration amount of a spot of the focus light on the desired data layer; and

an output controller operable to control output of the light source, wherein

the wavefront converter is driven in such a manner as to reduce the aberration amount detected by the aberration detector, and

the output controller is operable to hold learned data as to a relation between a driving amount to be inputted to the wavefront converter and the output of the light source, and to control the output of the light source based on the driving amount to be inputted to the wavefront converter and the learned data, the driving amount being changed depending on the aberration of the focus light spot.

18. (New) The optical head device according to Claim 17, further comprising a driving amount detector operable to detect the driving amount to be inputted to the wavefront converter, wherein the output controller is operable to control the output of the light source based on the driving amount detected by the driving amount detector.

19. (New) The optical head device according to Claim 17, wherein the output controller is operable to control the output of the light source based on the product of a direct current component and an alternate current component of the driving amount to be inputted to the wavefront converter.

20. (New) The optical head device according to Claim 17, wherein the wavefront converter is a liquid crystal device.

21. (New) The optical head device according to Claim 17, wherein the wavefront converter includes a plurality of lenses, and a lens driver operable to drive one of the plurality of lenses to change a distance between the one lens and another one of the plurality of lenses, and the lens driver is driven in such a manner as to reduce the aberration amount detected by the aberration detector.

22. (New) The optical head device according to Claim 17, wherein the output controller is operable to control the output of the light source based on the driving amount and the learned data so as to compensate for a spherical aberration of the order higher than a highest order of aberration compensatable by the wavefront converter.

23. (New) An optical recording device comprising:
the optical head device of Claim 17; and
a rotation driver operable to rotate the optical recording medium.

24. (New) The optical head device according to claim 9, further comprising driving means for driving the wavefront converting means based on the aberration amount detected by the aberration detecting means.

25. (New) The optical head device according to claim 9, wherein the output controlling means comprises a computer.

26. (New) The optical head device according to claim 9, wherein the aberration detecting means comprises a computer.

27. (New) The optical head device according to claim 17, further comprising a driver operable to drive the wavefront converter based on the aberration amount detected by the aberration detector.

28. (New) The optical head device according to claim 27, wherein the driver comprises a voice coil motor.

29. (New) The optical head device according to claim 17, wherein the output controller comprises a computer.

30. (New) The optical head device according to claim 17, wherein the aberration detector comprises a computer.